

**Commonwealth of Massachusetts  
Office of Consumer Affairs & Business Regulation  
DIVISION OF ENERGY RESOURCES**

**RENEWABLE ENERGY PORTFOLIO STANDARD  
GUIDELINE  
ON THE  
RPS ELIGIBILITY OF BIOMASS GENERATION UNITS**

**June 2, 2006  
(Draft for Public Review)**

*Pursuant to the Renewable Energy Portfolio Standard Regulations at 225 CMR 14.00*

This Guideline<sup>1</sup> describes the eligibility criteria and procedures by which the Division of Energy Resources (“DOER” or “the Division”) shall determine whether an existing or proposed, biomass-fueled, Generation Unit uses “low-emission, advanced biomass power conversion technologies,” as mandated by the RPS statute<sup>2</sup> and provided in the RPS Regulations at 225 CMR 14.05(1)(a)6.<sup>3</sup> The Guideline is divided into two sections, the first pertaining to the eligibility criteria for “low-emissions” and the second to the eligibility criteria for “advanced biomass power conversion technologies.”

This Guideline shall become effective immediately upon the date of its issuance and shall continue in force until the date on which it is superseded by a revised version. The Guideline shall apply to Statement of Qualification Applications that are received and deemed administratively complete by DOER on or after the effective date of the Guideline and before a subsequent revision takes effect.

DOER expects that future revisions will be necessitated by improvements in biomass energy and air pollution technologies over time. That is the reason for DOER’s establishment of the specific RPS eligibility criteria for biomass-fueled Generation Units by means of Guidelines rather than in the RPS Regulations themselves. Any revision of this Guideline that modifies eligibility threshold values or criteria (as detailed below) shall become effective on the twenty-four month anniversary of the issuance date of such revision, as provided at 225 CMR 14.05(1)(a)6.a. Each such revision of this Guideline shall apply to Statement of Qualification Applications received and deemed administratively complete by DOER on or after the effective date of such revision and before a subsequent revision takes effect. Revisions that do *not* establish eligibility threshold values or criteria shall become effective upon their dates of issuance or on such dates as are specified in the revisions themselves.

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<sup>1</sup> This Guideline, along with guidelines on other topics that DOER may issue from time to time, collectively constitute the *Massachusetts RPS Guidelines*, as the term “Guidelines” is defined in the RPS Regulations at 225 CMR 14.02.

<sup>2</sup> The RPS statute at M.G.L. Ch. 25A, Section 11F, is available at <http://www.mass.gov/legis/laws/mgl/25a-11f.htm>.

<sup>3</sup> The RPS Regulations are available at <http://www.mass.gov/doer/rps/225cmr.pdf>.

## **Background**

In order for a biomass-fueled Generation Unit to qualify as a New Renewable Generation Unit under the RPS Regulations, it must meet the Eligibility Criteria at 225 CMR 14.05(1). Among those criteria are the fuel and technology criteria at 14.05(1)(a)6, which requires that such a Unit use “Low-emission, advanced biomass power conversion technologies using an Eligible Biomass Fuel. . . . subject to the limitations set forth herein.” That language is based on identical language in the RPS statute<sup>4</sup> The Guideline expands upon the language of the Regulations, to provide the details by which DOER will evaluate Statement of Qualification Applications for biomass-fueled Units to qualify as New Renewable Generation Units under the RPS Regulations. As such, the criteria and procedures described herein are intended to replace the need for Advisory Rulings, for which the Proposed RPS Regulations also issued today no longer provide.

The Advisory Ruling provision proposed to be removed from the regulations (now at 225 CMR 14.06(5)) has provided a method for an applicant to receive a determination from DOER of whether or not its Generation Unit would likely receive approval as a New Renewable Generation Unit prior to submitting an application for a Statement of Qualification. Its purpose was to provide assurance to owners of Generation Units early in the development of a project, at a level sufficient to obtain financing. The Advisory Ruling was primarily used for biomass Generation Units due to, in part, the lack of specific guidance available from DOER on what constituted low-emissions and advanced biomass power conversion technologies. In practice, the Advisory Rulings evolved into being viewed by recipients and others as *de facto* DOER approvals, in that it was assumed that a Statement of Qualification subsequently would be granted automatically if a plant’s final description matched that in the Advisory Ruling. Hence, biomass plant developers came to depend on Advisory Rulings as a critical prerequisite for obtaining financial support. This was the case even when a proposed project was substantially the same as a project for which a previous Advisory Ruling has been issued. Thus, the process of a developer requesting an Advisory Ruling, and DOER responding to the request, has become an additional step, with its attendant cost and burden for both parties.

Almost four years have elapsed since the RPS Regulations went into effect in April 2002. During that time, DOER issued a number of Statements of Qualification and Advisory Rulings for biomass Generation Units. In addition, DOER and the Massachusetts Department of Environmental Protection (“MassDEP”) conducted a public Inquiry on biomass technologies during the summer of 2005.<sup>5</sup> Based on the experience and knowledge acquired thereby, DOER now issues this Guideline to provide sufficient clarity and predictability to biomass Unit developers and eliminate the need for case-by-case Advisory Rulings.

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<sup>4</sup> M.G.L. Ch. 25A, Section 11F(b)(viii). See footnote 2 for on-line availability.

<sup>5</sup> This Guideline follows up DOER’s *Notice of Inquiry Regarding Some Proposed Revisions of the Regulations Pertaining to the Definition of “Low-Emission, Advanced Biomass Power Conversion Technologies”* (“NOI”) and the comments received from stakeholders in response to the NOI. The NOI, comments, and other related documentation are available at [http://www.mass.gov/doer/rps/notice\\_of\\_inquiry.htm](http://www.mass.gov/doer/rps/notice_of_inquiry.htm) and will not be reiterated here.

## **Section One**

### **RPS Low-Emission Criteria**

To qualify as a New Renewable Generation Unit under the RPS Regulations, a biomass Generation Unit must be deemed by DOER to be one that uses a “low-emissions” technology; that is, a technology that results in the Unit being characterized as having low emissions of pollutants. The statute does not specify which pollutants must be minimized or what level of emissions should be considered as “low,” thereby leaving to DOER the responsibility of doing so, in the public interest and pursuant to the intent of the legislature. Since the outset of the program, DOER has worked in close consultation and cooperation with MassDEP, the Commonwealth’s lead agency in such matters. This Guideline now defines what constitutes “low emissions,” solely for the purpose of RPS qualification. In addition to meeting the emission levels required by this Guideline, the RPS Regulations continue to require that the Generation Unit must be in receipt of a Valid Air Permit from the applicable agency of the jurisdiction in which the Unit is located.<sup>6</sup>

This Guideline provides details on the methodology and specifications by which a Generation Unit will be judged to meet the low emissions criteria, and also describes the requirements for monitoring, reporting, and enforcement of emissions standards after a Unit has been deemed RPS-qualified.

However, it is important to note that *this Guideline provides low emissions specifications only for Units that use wood-fired and other solid-fueled steam boilers*. The current version of the Guideline, in addition to providing the solid-fueled boiler specifications, describes the procedures through which DOER, in consultation with MassDEP, will determine the low-emission criteria for projects that propose to use *other* fuels or power conversion technologies.

Given the range of eligible biomass fuels and power conversion technologies, the Guideline is unable to provide “low emissions” specifications for all Units that potentially may seek RPS qualification. In the meantime, DOER, with MassDEP, will review on a case-by-case basis all proposed projects *not* of the type covered in this Guideline. As a consequence of such reviews, DOER, with MassDEP, may develop specifications to cover other types of fuels and technologies. DOER will issue those specifications in subsequent revisions of this Guideline.

### **RPS Emission Limits for Wood-Fired and Other Solid-Fueled Steam Boilers**<sup>7</sup>

For the sole purpose of qualifying for the MA RPS, a biomass Generation Unit using a wood-fired steam boiler or other solid fueled steam boiler must not exceed monthly average emission limits for nitrogen oxides (NO<sub>x</sub>) and particulate matter (PM) that are specified in Table

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<sup>6</sup> See the definition of Valid Air Permit in the RPS Regulations at 225 CMR 14.02. Note, that if such a permit is not required in that jurisdiction or for a Unit of that size or type, then the Regulations at 225 CMR 14.05(1)(a)6.e provide that the Unit’s emission rates simply must be consistent with criteria set forth in this Guideline, a matter discussed below.

<sup>7</sup> It must be noted that biomass-fired boilers may make incidental use of fossil fuels for the purpose of plant start-up. Any non-incidental use of ineligible fuels would require a Co-Firing and Composite Fuel Waiver, as provided in the Regulations at 225 CMR 14.05(3).

One for Units of three nameplate capacity ranges.<sup>8</sup> It should be noted that these limits may be different, both in magnitude and in averaging period, from the limits specified in the Unit's Valid Air Permit, and that they must be separately reported to DOER on a quarterly basis.<sup>9</sup>

**Table One**  
**RPS Monthly Average Emission Limits**  
**for Wood-Fired and Other Solid-Fueled Steam Boilers**

| Nameplate Capacity | NO <sub>x</sub>  | PM               | Monitoring/Testing  |
|--------------------|------------------|------------------|---|
| < 1 MW             | 0.30 lbs /MMBtu  | 0.012 lbs /MMBtu | Portable monitor for NO <sub>x</sub> , O <sub>2</sub> , & CO. <sup>10</sup> Initial stack test for PM, <sup>11</sup> NO <sub>x</sub> , <sup>12</sup> & CO, <sup>13</sup> and retest every five years. |
| 1-10 MW            | 0.10 lbs /MMBtu  | 0.012 lbs /MMBtu | Portable monitor for NO <sub>x</sub> , O <sub>2</sub> , & CO. <sup>14</sup> Initial stack test for PM, NO <sub>x</sub> , & CO, and retest every three years   |
| > 10 MW            | 0.065 lbs /MMBtu | 0.012 lbs /MMBtu | CEMS for NO <sub>x</sub> & CO. <sup>15</sup> Annual stack test for PM. CO CEMS as surrogate for PM monthly average.   |

In the case of a Generation Unit that has multiple boilers, the size ranges and emission limits of Table One apply to a shared smokestack. For example, if a Unit has two boiler/turbine sets of 8 MW each and they share one smokestack, the size range will be ">10 MW." If a Unit has multiple stacks, each serving one or a discrete number of boilers, then the size range and emission limit would apply to each stack separately. It is important to note that, in the case of a Unit with multiple stacks, the weighted average NO<sub>x</sub> and weighted average PM

<sup>8</sup> DOER has determined in consultation with the DEP that these two pollutants are the two most critical ones for wood-fired boilers. Emissions of other criteria pollutants are adequately addressed in state air permits.

<sup>9</sup> The monitoring and reporting of these emissions, as well as their relation to the RPS qualification of GIS certificates are described in the section titled "Emissions Monitoring, Reporting, and Enforcement," below.

<sup>10</sup> Concentrations of CO, O<sub>2</sub>, and NO<sub>x</sub> shall be measured daily with a portable monitor that satisfies 40 CFR 60, Appendix B PS-2. The monitor shall be calibrated before use and the sample shall be taken from a location that satisfies the requirements of 40 CFR 60 Appendix A Methods 1 and 2. At least one sample shall be taken each day the boiler operates. Operation and maintenance of the monitor shall be according to the manufacturer's recommendations. CO is a surrogate limit for complying with the PM emissions limit. If the monthly average CO concentration exceeds 200 ppm @ 3% O<sub>2</sub>, the boiler will be considered to be in non-compliance with the PM emission limit. Portable monitors will be operated and maintained according to the manufacturers recommendations.

<sup>11</sup> Testing for PM shall be conducted in accordance with 40 CFR 60, Appendix A, Test Method 5.

<sup>12</sup> Testing for NO<sub>x</sub> shall be conducted in accordance with 40 CFR 60, Appendix A, Test Method 7E.

<sup>13</sup> Testing for CO shall be conducted in accordance with 40 CFR 60, Appendix A, Test Method 10.

<sup>14</sup> Specifications are the same as in footnote 10.

<sup>15</sup> The Continuous Emissions Monitoring System (CEMS) for NO<sub>x</sub> shall satisfy either 1) 40 CFR 60, Appendix B PS-2 with the QA/QC requirements of 40 CFR 60 Appendix F or 2) 40 CFR 75, except that missing data routines and bias adjustment factors do not need to be applied. The CEMS shall be operated at all times the boiler is operating except periods of CEMS calibration checks, zero span adjustment, and preventive maintenance. Notwithstanding such exceptions, in all cases the CEMS must obtain valid data for a minimum of 90% of the hours per month during which the emission unit is operating.

emissions from all of the stacks in the Unit must be in compliance with the RPS emission limits in order for the electricity output in a given month to qualify as New Renewable Generation and earn MA RPS qualified GIS certificates.<sup>16</sup> However, if a multiple stack Unit has a separate generator account at the NEPOOL GIS for each stack, then the Unit can be subdivided for the purposes of RPS low-emission compliance and GIS certificate qualification.

In the case of a Generation Unit that uses any solid Eligible Biomass Fuel(s) in conjunction with any ineligible fuel(s), whether by co-firing such fuels or by using a Composite Fuel, these size ranges and emission limits apply to the entire Unit, per the Co-Firing and Composite Fuel Waiver provisions at 225 CMR 14.05(3)(b).

Over time, the emissions limits of Table One will be lowered if it is determined that more stringent limits are commercially available and economically feasible. Any changes in these limits will be announced by DOER through a revised Guideline. To accommodate the timing of the power plant development process, such changes in emissions limits will become effective twenty-four months after they are issued. The limits will apply to all units for which an administratively complete Statement of Qualification Application is received on or after that effective date and until a subsequent revision takes effect.

### **Review for Other Fuels and Other Types of Biomass Units**

In the case of any proposed biomass Generation Unit that does *not* use a steam boiler fueled by wood or other solid fuel, DOER will consult with MassDEP by means of an interagency team to determine appropriate emission limits. Examples of such Units include but are not limited to the following:

- Boilers or engines fueled by biodiesel or bio-oil.
- Equipment fueled by biogas that is not the product of anaerobic digestion.<sup>17</sup>
- Bioreactors.

The interagency team will consist of DOER's RPS staff and one or more members of MassDEP's Biomass Review Team (BRT). The BRT will meet with project developers to provide them with guidance on applicable emission limits for RPS qualification for non-solid fueled Units or for Units that do not use steam boilers. In the case of projects located within Massachusetts, the BRT will also provide guidance to applicants on MassDEP air quality permitting requirements. The BRT will provide the following types of services:

- For in-state projects, provide an expedited process for determination of Best Available Control Technology (BACT) and other aspects of MassDEP permitting;
- Review any project if additional guidance is needed regarding the application of already established RPS emission limits;

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<sup>16</sup> The method for weighting will be specified in a Unit's Statement of Qualification.

<sup>17</sup> The use of anaerobic digester gas are treated in the RPS Regulations, at 225 CMR 14.02 and 14.05(1)(a)5, in the same manner as the use of landfill methane, rather than the use of biomass fuel.

- Review all projects for whose fuel or technology type the RPS Guidelines do not yet specify emission limits and recommend to DOER limits appropriate for the project.

As a follow-up of the third type of service, the BRT will recommend to DOER appropriate emission limits for fuels and technology types not already covered in the RPS Guidelines. The BRT will also periodically review existing RPS emission limits and recommend to DOER reductions in these emission limits as technology improves. DOER may revise the Guideline as appropriate to incorporate such recommendations.

### **State Air Permitting of Biomass Generation Units**

In order to qualify as a New Renewable Generation Unit, a biomass-fueled Unit must receive a Valid Air Permit from the applicable environmental agency of the jurisdiction in which the Unit is or will be located.<sup>18</sup> The RPS Regulations at 225 CMR 14.02 define Valid Air Permit as follows:

Valid Air Permit. Within the United States, a current and effective authorization, license, certificate, or like approval to construct and/or operate a source of air pollution, issued or required by the regulatory agency designated in the applicable State Implementation Plan to issue permits under the Clean Air Act, 42 U.S.C. §§ 7401, et seq., as amended. In jurisdictions outside of the United States, it shall be a document demonstrating an equivalent authorization.

The pollutants covered and the emission standards in such permits may differ from the RPS emission limits. The MA RPS low-emission criteria pertain only to the RPS qualification of the Unit and of the conditions governing the RPS qualification of its electricity output. They in no way replace the air emission obligations required by the regulatory agency that has jurisdiction where an RPS-qualified Unit is located.

For Generation Units located in Massachusetts, MassDEP has established a set of emissions limits that it suggests as the starting point for BACT for wood-fired boilers within given size ranges. MassDEP will post those limits as guidance at its own website and may revise or supplement them from time to time.<sup>19</sup> MassDEP will determine the effective dates of any changes that it makes in its BACT guidelines and procedures.

For Generation Units *not* located in Massachusetts, applicants must provide proof of receipt of a Valid Air Permit from the applicable regulatory agency. If such Valid Air Permit has not yet been obtained by the applicant and provided to DOER by the time the Statement of Qualification Application review has been successfully completed, DOER may, in its sole discretion, issue a Statement of Qualification in which providing DOER with a copy of its Valid Air Permit is a condition of the RPS qualification.

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<sup>18</sup> The exception is noted in footnote 6.

<sup>19</sup> The DEP website is at <http://www.mass.gov/dep/>.

## **Emissions Monitoring, Reporting, and Enforcement**<sup>20</sup>

For any solid biomass-fueled Generation Unit with a smokestack serving one or more steam boilers and generation equipment whose total nameplate capacities are equal to or greater than 10 MW, NO<sub>x</sub> emissions shall be monitored with a Continuous Emissions Monitoring System (CEMS) that satisfies either 40 CFR 60 Appendix B PS-2 (with the QA/QC requirements of 40 CFR 60 Appendix F) or 40 CFR 75, except that missing data routines and bias adjustment factors do not need to be applied. The NO<sub>x</sub> CEMS shall be operated at all times that the boiler is operating except during periods of CEMS calibration checks, zero span adjustment, and preventive maintenance. Notwithstanding such exceptions, in all cases the CEMS must provide valid data for a minimum of 90% of the hours per month during which the Unit is operating. A CO CEMS also shall be used, and average monthly CO concentration will provide a surrogate limit for PM. If the combined monthly average CO concentration from all of the stacks in the Unit exceeds 200 ppm @ 3% O<sub>2</sub>, the Unit shall be considered to be in non-compliance with the PM emission limit. In addition, an annual stack test shall be required for PM.

For any solid biomass-fueled Generation Unit with a smokestack serving one or more steam boilers and generation equipment whose total nameplate capacities are below 10 MW, concentrations of NO<sub>x</sub>, CO, and O<sub>2</sub> shall be measured daily with a portable monitor. The portable monitor shall satisfy 40 CFR 60, Appendix B PS-2. The monitor shall be calibrated before use, and the sample shall be taken from a location that satisfies the requirements of 40 CFR 60 Appendix A Methods 1 and 2. At least one sample shall be taken each day the boiler operates. Operation and maintenance of the monitor shall be according to the manufacturer's recommendations. The monthly average CO concentration will provide a surrogate limit for complying with the PM emissions limit. If the combined monthly average CO concentration from all of the stacks in the Unit exceeds 200 ppm @ 3% O<sub>2</sub>, the Unit shall be considered to be in non-compliance with the PM emission limit.

For a Unit below one MW nameplate capacity, an initial stack test shall be performed for PM, NO<sub>x</sub>, and CO, with a retest every five years. For a Unit with a nameplate capacity of one through 10 MW, an initial stack test shall be performed for PM, NO<sub>x</sub>, and CO, with a retest every three years.

For any biomass Unit that does not use a solid-fueled steam boiler, NO<sub>x</sub> and PM emission limits, monitoring, and reporting shall be established by DOER/DEP interagency team and specified in the Unit's Statements of Qualification.

The Owner, Operator or authorized agent of a biomass Generation Unit shall submit to DOER, with a copy to MassDEP (*and* to its own regulatory agency, if not located in Massachusetts), the following reports and other documentation per the timetable noted or immediately upon their availability:

- MA RPS Quarterly Low-Emission Report scheduled as specified in Table Two. Each such report shall include a cover letter that states what is attached, summarizes the emission and compliance information derived from the Unit's CEMS and/or portable monitors (including the monthly average for each stack and the average for all stacks),

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<sup>20</sup> To the extent deemed necessary, additional protocols and procedures beyond those described in this section will be included in a Unit's Statement of Qualification and may be incorporated in subsequent revision of this Guideline.

and the certification required in the RPS Regulations at 225 CMR 14.10 (1). The certification shall be stated to cover both the information in the cover letter and in the electronic documentation. The date and *summary* result of the most recent, RPS-required stack test shall be included with each quarterly report. The cover letter shall be sent to DOER and MassDEP, and documentation for the information summarized in the cover letter shall be provided *only* on a compact disk sent to DOER and MassDEP, except for stack test data, which shall be provided as described below.

- Whenever a new, RPS-required stack test occurs and is reported to the Unit's own regulatory agency, a copy to DOER and MassDEP of a *summary* of the results. In the case of a stack test conducted to satisfy only the requirements of MA RPS and not those of the Unit's own regulatory agency, the entire report specified in the Unit's Statement of Qualification must be sent to DOER and MassDEP on a compact disk along with a summary. A summary of that report shall be sent as hard copy to both DOER and MassDEP and must include the certification required in the RPS Regulations at 225 CMR 14.10 (1). The certification shall be stated to cover both the information in the cover letter and in the electronic documentation. The date and results of each such stack test (but not documentation previously submitted) also shall be included in each MA RPS Quarterly Low-Emission Report until superseded by the results of a later stack test.
- Notification to DOER of any enforcement action by the applicable environmental agency, as required in the RPS Regulations at 225 CMR 14.06 (5), since such action may affect the RPS qualification of the Unit.

**Table Two**  
**Schedule for MA RPS Quarterly Low-Emission Reports**

| <b>Quarter</b> | <b>Months Reported</b> | <b>Report Due to DOER</b> |
|----------------|------------------------|---------------------------|
| 1              | Jan, Feb, Mar          | April 30                  |
| 2              | Apr, May, Jun          | July 30                   |
| 3              | Jul, Aug, Sep          | October 31                |
| 4              | Oct, Nov, Dec          | January 31                |

For any calendar month during which the reported monthly average emissions level for NO<sub>x</sub> or PM exceeds its RPS emissions limit<sup>21</sup> or is found to be in non-compliance with any provisions of its Statement of Qualification, the Unit's Owner, Operator, or authorized agent will be in non-compliance with the requirements of 225 CMR 14.00 and shall be subject to the provisions of 225 CMR 14.12. In addition, DOER will take appropriate action through the NEPOOL GIS to assure that the electricity output of the Generation Unit will not have MA RPS New Renewable Generation Attributes and, thereby, will not receive MA RPS-qualified GIS Certificates.

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<sup>21</sup> In the case of PM, this would apply in the case of an exceedance of the surrogate CO limit.



For any calendar month during which a required, periodic PM stack test of the Unit reveals exceedance of the RPS PM emission limit, the Unit's Owner, Operator, or authorized agent will be in non-compliance with the requirements of 225 CMR 14.00 and shall be subject to the provisions of 225 CMR 14.12. In addition, DOER will take appropriate action through the NEPOOL GIS to assure that the electricity output of the Generation Unit will not have MA RPS New Renewable Generation Attributes and, thereby, will not receive MA RPS-qualified GIS Certificates. RPS qualification of the output from the Unit will resume as of the first complete month after a subsequent stack test demonstrates RPS compliance.<sup>22</sup>

In order to return to RPS compliance, the Unit's Owner, Operator or authorized agent must demonstrate to the satisfaction of DOER that the emission limits are again being met. In the case of a Unit that has been in non-compliance for a period of three months, such demonstration must include a report in which an Authorized Representative of the Owner, Operator or authorized agent describes and certifies the reasons for the exceedance and of actions taken to restore the Unit's operation to compliance with the low-emission conditions of its Statement of Qualification, including or followed by documentation satisfactory to DOER of such restored compliance. Documentation must include a quarterly MA RPS Low-Emission Report and/or PM stack test results.

It is important to note that, if a Generation Unit has more than one smokestack, and the emissions from each are controlled, monitored and reported separately, but the Unit has a single generator account with the NEPOOL GIS, the weighted average NO<sub>x</sub> and the weighted average PM emissions<sup>23</sup> from all of the stacks in the Unit combined must be in compliance with the RPS emission limits in order for the electricity output in a given month to qualify as New Renewable Generation and earn MA RPS qualified GIS certificates.<sup>24</sup>

Possession of a Valid Air Permit is a threshold eligibility criterion for RPS qualification (except when such permit is not required by the applicable agency). DOER recognizes that minor or short term violations of applicable permit conditions and environmental regulations may occur from time to time, and such violations will not necessarily affect continued qualification of a Unit as an RPS Qualified Generation Unit. However, DOER, in consultation with MassDEP, may review reports of enforcement actions by applicable environmental agencies, and DOER may find a Unit's Owner, Operator or authorized agent in non-compliance with the requirements of 225 CMR 14.00. In case of such a finding, they shall be subject to the provisions of 225 CMR 14.12. Suspension or revocation of a Unit's Valid Air Permit will result in DOER's suspension of the Unit's qualification or other action that DOER deems appropriate under the provisions of 225 CMR 14.12.

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<sup>22</sup> DOER understands that, in limited circumstances, the GIS Administrator could encode GIS certificates as RPS-qualified as of the day following a successful PM stack test, as requested by DOER. However, such immediate qualification is subject to the ability of the GIS and of the GIS Administrator. Otherwise, RPS qualification would resume as of the month following the successful stack test. The above notwithstanding, in the case of an unsuccessful stack test and a subsequent successful stack test both in the same month, RPS qualification will resume as of the following month unless the Owner, Operator or authorized agent or Operator of the Unit can demonstrate to the satisfaction of DOER that the first test was an anomaly.

<sup>23</sup> The method for weighting will be specified in a Unit's Statement of Qualification..

<sup>24</sup> As noted earlier, if a multiple stack Unit has a separate generator account at the NEPOOL GIS for each stack, then the Unit can be subdivided for the purposes of RPS low-emission compliance and GIS certificate qualification.

### **Low Emission Criteria for Units That Do *Not* Require Valid Air Permits**<sup>25</sup>

If a biomass-fueled Generation Unit located outside Massachusetts does not require a preconstruction air permit, and if the fuel, technology type, and size of the Unit are such that the Unit would, if located in Massachusetts, require an air plan approval or some other form of Valid Air Permit, then the following criteria shall apply *solely* for MA RPS qualification:

- If the Unit uses a wood-fired or other solid-fueled steam boiler, then the emission limits of Table One, above, will apply, along with the monitoring, reporting, and enforcement conditions described above.
- If the Unit is of a type, fuel, and size that it would, if located in Massachusetts be governed by MassDEP's Engine and Combustion Turbine regulations at 310 CMR 7.00 et seq. and 310 CMR 70.00, then the fuel and emission limit provisions of those regulations would apply.
- All other Units that are of a fuel and size that would necessitate, if located in Massachusetts, a Valid Air Permit, but that would neither use a solid biomass-fired steam boiler nor be governed by MassDEP's Engine and Combustion Turbine regulations, shall be evaluated as to air emissions by the BRT procedure described above.

If a biomass-fueled Generation Unit does not require an air permit because its size is *below the threshold* for regulations that would otherwise apply in either its own jurisdiction or in Massachusetts, then DOER will undertake a case-by-case review, as follows. DOER will determine if the Unit meets the Advanced Biomass Power Generation Technology criteria through the process described in Section Two of this Guideline. If the Unit does meet those criteria, DOER may consult with MassDEP to determine whether the Unit would raise any air quality concerns for MassDEP. After such consultation, DOER may decide that the Unit qualifies as meeting the low-emissions standard either with or without any emission limitation conditions being included in its Statement of Qualification.<sup>26</sup>

### **Low Emissions and New Unit Start-Up**<sup>27</sup>

When a new biomass Generation Unit begins to generate electricity using Eligible Biomass Fuel(s), its output will qualify as New Renewable Generation only *after* it demonstrates to the satisfaction of DOER, in consultation with MassDEP, that the Unit is meeting the low-emission conditions in its Statement of Qualification.<sup>28</sup> DOER will deem those limits to have been met when all of the following conditions have been met:

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<sup>25</sup> See 225 CMR 14.05(1)(a)6.e.

<sup>26</sup> DOER may issue further guidance pertaining to small Units in subsequent revisions of the Guideline.

<sup>27</sup> This section pertains to all Units with steam boilers. In the case of all other types of Units, the provisions pertaining to low emissions and new Unit start-up will be specified in the Unit's Statement of Qualification.

<sup>28</sup> In the case of a new Unit designed to burn either an ineligible fuel *or* an Eligible Biomass Fuel, and where sole use of an Eligible Biomass Fuel follows the end of start-up and testing of the Unit with the ineligible fuel, then the averaging of monthly emissions and the compliance with any other RPS emissions requirements will commence when the use of the ineligible fuel ends and sole use of the Eligible Biomass Fuel begins.

1. If a CEMS is required for the Unit, the NO<sub>x</sub> CEMS has been certified in the manner specified either in its pre-construction air permit, other Valid Air Permit, or its Statement of Qualification.
2. If, for the month in which a required CEMS or PMS has been duly certified or required portable monitor use has commenced, the NO<sub>x</sub> emissions averaged over the remainder of that calendar month do not exceed the NO<sub>x</sub> limit, beginning the day after the CEMS has been duly certified or portable monitor use has commenced.
3. If the most recent stack test, if required, demonstrates compliance with the PM limit.

When DOER is satisfied that all three of those conditions have been met, DOER will designate as the RPS Effective Date the later of (a) the day after the successful stack test, or (b) the day after CEMS certification, or (c) the day after commencement of portable monitor use. GIS Certificates created for electricity output as of the Unit's RPS Effective Date will be encoded as MA RPS-qualified New Renewable Generation and will continue to be encoded as such so long as the Unit's emission limits and other conditions of the Unit's Statement of Qualification continue to be met.<sup>29</sup>

DOER may, at its discretion and in consultation with MassDEP, provide for and include in a Unit's Statement of Qualification a limited optimization period. During an optimization period, the electricity output from a Unit would qualify as New Renewable Generation if it meets a specified, less stringent limit for one or both of the two pollutants. In the case of a Unit with an optimization period, the RPS Effective Date for the optimization period would commence as described in the previous paragraph and would continue until *either* of the following two conditions is reached:

1. The optimization period reaches the time limit provided in the Statement of Qualification, after which the output will not be qualified as New Renewable Generation until compliance with the final limits specified in its Statement of Qualification is demonstrated in the manner described in the previous paragraph.
2. The emissions of the two pollutants are in compliance with final limits provided in the Statement of Qualification. DOER will deem those limits to have been met when the NO<sub>x</sub> emissions averaged over one complete calendar month do not exceed the NO<sub>x</sub> limit, and the most recent certified stack test demonstrates compliance with the PM limit.

In the case of a Generation Unit that does not require CEMS or portable monitoring of NO<sub>x</sub> or stack testing of PM, the qualification and initial encoding of GIS Certificates as New Renewable Generation shall be done as specified in the Unit's Statement of Qualification.

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<sup>29</sup> Such encoding of GIS certificates shall be done by a procedure to be agreed upon between the GIS Administrator and DOER and shall be communicated to Unit Owner, Operator or authorized agent as appropriate.

## **Section Two**

### **Advanced Biomass Power Generation Technology Criteria**

This section of the Guideline describes the method and specifies information required for an applicant to receive a DOER determination that its biomass Generation Unit uses an advanced biomass power conversion technology under 225 CMR 15.01(1)(a)6.b. One purpose is to provide sufficient advance guidance to potential developers of biomass Generation Units. Another purpose is to assist the Owner, Operator or authorized agent of such a Unit in preparing an application for a Statement of Qualification with sufficient thoroughness that DOER can expeditiously determine if the technology of the Generation Unit qualifies as advanced biomass power conversion technology. In any case, DOER reserves the right to request additional information in support of an application if such information is needed for such determination.

Henceforth, in lieu of the previously available Advisory Ruling process, an applicant shall participate in the pre-application review process described below. This process, combined with the specific guidance for an advanced biomass power conversion technology determination provided herein, is intended to provide a good indication to an applicant in advance of submitting an application for a Statement of Qualification of the likelihood that its Generation Unit would receive a positive determination by DOER on its RPS qualification.

#### **Pre-Application Review Process**

A potential applicant should contact DOER early in the development process of its biomass Generation Unit to review the proposed design and expected performance outcomes with the agency. DOER will review this information with applicants through meetings in advance of the applicant's formal application for a Statement of Qualification. Through this information exchange, the applicant will receive a preliminary indication of the likelihood their project, as described, will meet the requirements for receiving a Statement of Qualification certifying its RPS eligibility. The process is expected to provide the applicant with necessary guidance for further development of its biomass Generation Unit and submission of a complete application. Nevertheless, any indication of potential RPS eligibility provided by DOER during this pre-application review process will not be considered as binding the agency's ultimate decision on a Statement of Qualification, and no project will be deemed RPS-eligible until issuance of a Statement of Qualifications by DOER to that effect.

There is no prescribed number of meetings that DOER anticipates for this process. However, the applicant should expect, at minimum, an initial meeting to introduce the project, followed by another meeting that provides further details of the project. Although an applicant is not required to follow this pre-application process, it can be expected that if it does, it is likely to increase the chances that it will submit a more complete application and receive a more timely review and decision by DOER.

## **Evaluation Criteria for Making an Advanced Technology Determination**

This section defines the eligibility criteria for “advanced biomass power conversion technologies” by which DOER will determine whether a particular Generation Unit qualifies. DOER will evaluate a combination of qualitative and quantitative information regarding specific biomass plant attributes that an applicant shall provide. The required information is detailed in the section following this one. DOER will evaluate that information in light of the technologies available in the marketplace and of the state of the market with regard to the usage of such technologies.

The *Primary Eligibility Criteria* are the most important criteria that DOER will consider in its determination of whether a Unit uses an “advanced biomass power conversion technology.” DOER will first consider the efficiency by which fuel is converted to usable energy, expressed as “net heat rate” (defined below). *It is important to note that the net heat rate figures are targets toward which to strive, **not** threshold values that must be met.*

To the extent that DOER finds that a proposed Unit’s projected net heat rate does not closely approach the applicable efficiency figure, DOER will give weight to the other Primary Eligibility Criterion, namely the design of the fuel conversion process. This means that *if*, in order to meet particular needs of the project, including but not limited to those related to fuel supply or space availability, the developer has selected an appropriate state-of-the-art system design or design feature that does not approach the appropriate efficiency target, DOER may determine that, on balance, the Unit is utilizing an advanced power conversion technology. Note that new technologies or technologies that are still in the demonstration phase of development will receive special consideration under this criterion.

If DOER determines that the two Primary Eligibility Criteria, taken together, are not clearly sufficient to enable DOER to determine whether or not a proposed Unit is utilizing an advanced power conversion technology, then DOER will consider one or both of the *Secondary Eligibility Criteria* in order to make a final determination.

### ***Primary Eligibility Criteria***

#### **A. Efficiency of Fuel Conversion to Usable Energy**

An eligible Generation Unit shall achieve high efficiency in the process of converting fuel to electricity, as determined by comparing the proposed Unit’s net heat rate with the best commercially achievable net heat rate for the fuel conversion process proposed.<sup>30</sup> If the Unit proposes to use solid biomass fuel with stoker or fluidized bed combustion technology, DOER will use the target values in Table Three below to evaluate the plant’s net heat rate at a standard fuel moisture specification of 45%. For other fuel conversion technologies, DOER will consider how closely the net heat rate approaches that which DOER ascertains (if possible) to be optimal for the chosen fuel stream and technology type.

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<sup>30</sup> In the case of a combined heat-and-power plant, usable heat shall be included in the determination of efficiency, and due consideration will be given to the unique challenges posed by non-combustion and bio-reactor technologies.

**Table Three**  
**Target Net Heat Rates (in Btu/kWh) for**  
**Wood and Other Solid Fuel-Fired Steam Boilers<sup>31</sup>**

| Capacity per Turbine                               | Stoker | Fluidized Bed |
|--|--------|---------------|
| Equal to or greater than 1 MW and less than 10 MW  | 15,500 | 16,500        |
| Equal to or greater than 10 MW and less than 25 MW | 14,000 | 15,000        |
| Equal to or greater than 25 MW                     | 12,500 | 13,500        |

**B. Design of Fuel Conversion Process**

An eligible Generation Unit shall utilize state-of-the-art design for converting biomass fuel to electrical energy.

***Secondary Eligibility Criteria***

**C. Fuel Handling and Conditioning**

A Generation Unit not clearly eligible under the Primary Eligibility Criteria alone may, nonetheless, be deemed eligible by demonstrating technology for fuel handling and conditioning that is not commercially practiced in the United States at the time of application.

**D. New Market Applications**

A Generation Unit not clearly eligible under the Primary Eligibility Criteria alone may, nonetheless, be deemed eligible if the particular use of the Unit for energy production from biomass is not a common one in the Northeast and whose expanded usage will lead to technology improvements that will enable future such units to qualify under the Primary Eligibility Criteria.

**Information Required for Making an Advanced Technology Determination<sup>32</sup>**

In providing information to DOER, the applicant must explain how and to what extent its Generation Unit will meet or address each of the criteria for being judged to be eligible with the

<sup>31</sup> Information from *Lessons Learned from Existing Biomass Power Plants* (a February 2000 report to the National Renewable Energy Laboratory, available on line at <http://www.nrel.gov/docs/fy00osti/26946.pdf>) was used in developing these net heat rate targets.

<sup>32</sup> DOER may incorporate the information specified below into a prescribed format for filing a Statement of Qualification Application.

advanced biomass power conversion technologies requirement. Although this section of the Guideline specifies the information an applicant must or may provide for DOER to conduct its review, an applicant should not limit itself to the information prescribed herein and is, indeed, encouraged to submit any additional information that it believes could assist DOER in its evaluation and determination. DOER will evaluate the information provided in light of the technologies available in the marketplace and of the state of the market with regard to the usage of such technologies.

### ***Primary Eligibility Criteria***

#### **A. Efficiency of Fuel Conversion to Usable Energy**

Applicant shall provide the following:

##### ***1. For all types of plants, as applicable:***

- a. A description of the type of equipment to be used to transform the energy content of the Eligible Biomass Fuel into electrical energy and, if relevant, useful thermal energy and useful products.
- b. The Eligible Biomass Fuel(s) to be used and its Higher Heating Value (HHV), as used.
- c. In the case of a Unit that will co-fire an ineligible fuel with an Eligible Biomass Fuel (or will use Composite Fuels), a description of the fuels (including the constituents of Composite Fuels), and their relative proportions of the fuels (or of the constituents) by both weight and HHV. Also describe the method by which the quantities and relative heating values will be assured, monitored, and documented to DOER.
- d. The expected net heat rate of the Generation Unit. "Net heat rate" is defined here as the ratio of the fuel energy input to the net electrical output of the generation unit (Btu/kW-hr).
- e. Justification that this is the best net heat rate achievable, including any contributing factors that raise this net heat rate above what might otherwise be achieved.
- f. Any economic considerations in making design and operational decisions that adversely impact the Generation Unit's net heat rate.
- g. Any processes that plant personnel will evaluate after operation begins to improve net heat rate.

##### ***2. For plants using wood or other solid-fuel fired, stoker or fluidized bed, steam boilers:***

- a. Specify what the resulting plant heat rate would be using the standard fuel moisture specification of 45%. DOER will use the target values in Table Three to evaluate the plant's net heat rate.

- b. Provide detailed justification for not meeting these target values (for example, whether the combustion technology has a higher than normal parasitic load).
- c. Specify the fuel design-basis moisture content. Explain why the fuel is expected to be at this moisture content, if and how the moisture content will be monitored/controlled to meet this specification, and the resulting expected heat rate.

**Table Three**  
**Target Net Heat Rates (in Btu/kWh) for**  
**Wood and Other Solid Fuel-Fired Steam Boilers<sup>33</sup>**

| Capacity per Turbine                               | Stoker | Fluidized Bed |
|--|--------|---------------|
| Equal to or greater than 1 MW and less than 10 MW  | 15,500 | 16,500        |
| Equal to or greater than 10 MW and less than 25 MW | 14,000 | 15,000        |
| Equal to or greater than 25 MW                     | 12,500 | 13,500        |

3. ***For combined heat and power plants:***

- a. Specify the thermal load, and provide a projected annual load duration curve.
- b. Describe the usefulness and intended uses of the thermal output, including information demonstrating the commitment of the thermal host.
- c. Specify the ***overall*** plant efficiency, which DOER will use for evaluation of efficiency in the case of CHP plants, as well as the individual efficiencies for the electrical and thermal outputs.

4. ***For bio-reactors and plants using other emerging technologies:***

- a. Specify and describe the technology to be used.
- b. Specify the overall plant efficiency, as well as the individual efficiencies for energy generation and for production of other product(s).
- c. Describe the products to be produced from the biomass refining or other processes and their intended use, including, if available and appropriate, contract arrangements.
- d. Specify the projected annual volume of product production from refining or other processes.

5. ***For plants using small engine generators or combustion turbines:***

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<sup>33</sup> Information from *Lessons Learned from Existing Biomass Power Plants* (a February 2000 report to the National Renewable Energy Laboratory, available on line at <http://www.nrel.gov/docs/fy00osti/26946.pdf>) was used in developing these net heat rate targets.



- a. Specify the type and size of equipment to be used, and whether it is, or would be if located in Massachusetts, regulated by MassDEP under its Engine and Combustion Turbine regulations at 310 CMR 7.00 et seq. and 310 CMR 70.00
  - b. Provide data, technical literature, or Internet hyperlinks to literature to enable DOER to compare the efficiency and other performance information of the proposed Unit with other units of the same type.
6. ***For plants using liquid bio-fueled steam boilers:***
- Provide data, technical literature, or Internet hyperlinks to literature to enable DOER to compare the efficiency and other performance information of the proposed Unit with other units of the same type.

**B. Design of Fuel Conversion Process**

Applicant shall include the following:

1. **For combustion-based conversion processes, specify the following:**
  - a. The method for feeding fuel to the combustion process.
  - b. The method for supplying and controlling combustion air.
  - c. A description of the actual combustion process (e.g., fuel is burned in suspension, on grates, etc.) and the degree and control of gasification of the fuel prior to combustion.
  - d. The process for collecting and discharging ash.
  - e. Factors considered in selecting this design. This should include, but not be limited to, any considerations regarding economics, fuel(s) to be used, emissions control, Generation Unit's planned use (e.g., peaking, backup, etc), type of location, space availability, etc.
  - f. Identify and provide a description of patents, if any, that would document that the project would utilize state-of-the-art design.
2. **For bioreactors and other non-combustion processes, specify the following:**
  - a. The method for introducing the fuel to the process.
  - b. How the fuel conversion process takes place, including the introduction of any catalyst(s) to the process.
  - c. The process for collecting and discharging any waste products from the conversion process.
  - d. Factors considered in selecting this design. This should include, but not be limited to, any considerations regarding economics, fuel(s) to be used and the Generation Unit's planned use.
  - e. Identify and provide a description of patents, if any, that would document that the project would utilize state-of-the-art design.

### *Secondary Eligibility Criteria*

#### **C. Fuel Handling and Conditioning**

Applicant may describe and justify any of the following, as appropriate, but only if the proposed design features are beyond what is commercially practiced in the United States:

1. The process for verifying that the fuel meets the specifications provided to the suppliers.
2. The processes and equipment used for sorting the fuel at the site of the Unit, if necessary.
3. The process for storing the fuel, and how long it is expected to be in storage. Include any measures taken to maintain safety and quality during fuel handling and storage.
4. Any processes for preparing the fuel for combustion or other energy conversion processes and for moving the fuel to the equipment where it will be converted to usable energy.
5. For manufactured fuels, such as wood pellet, biodiesel, and bio-oil, describe the technology and process of fuel manufacturing, highlighting advances in this fuel processing technology and justification for using such fuel.

#### **D. New Market Applications**

Applicant may choose to provide, to the extent deemed appropriate, any or all of the following information:

1. Identification of other locations where the proposed biomass technology is currently in use at the proposed scale, both in the Northeast and elsewhere.
2. Identification of the energy resources and/or technology being supplanted by this project.
3. A discussion of the extent to which this technology should be replicable in other locations or applications.
4. A description of how this energy resource and technology were chosen for this application.
5. Any other information that may be useful to DOER in determining that implementation of this project, as described, would represent a new market application.